

IN THE CLAIMS:

Claim 1 (currently amended): An apparatus for monitoring position, the apparatus comprising:

a cylinder having walls defining an interior and further having a length defined between a first end and a second end wherein the first end is opposite to the second end of the cylinder;

a first wall at the first end of the cylinder;

a shaft having a length defined between a first end and a second end wherein a portion of the shaft is within the interior of the cylinder and wherein the shaft moves the second end of the shaft moves between the first end of the cylinder and the second end of the cylinder within the interior of the cylinder wherein the second end of the shaft moves from a first position within the interior of the cylinder to a second position within the interior of the cylinder wherein the second end of the shaft transposes the interior of the cylinder between the first end and the second end of the cylinder;

a second wall at the second end of the cylinder wherein the second position of the second end of the shaft is located between the first position and the second wall at the second end of the cylinder;

an aperture within the first wall at the first end wherein light projects through the aperture into the cylinder; and

a sensor at the second wall of the cylinder wherein the sensor detects intensity of light within the interior of the cylinder at the second end of the cylinder which is not absorbed by the shaft and the interior of the cylinder wherein the intensity of light detected by the sensor at the second wall corresponds to a the second position of the shaft in the interior of the cylinder wherein a distance between the second end of the shaft and the second wall corresponds to the intensity of light detected by the sensor at the second wall.

Claim 2 (previously presented): The apparatus of Claim 1 wherein the second wall encloses the cylinder.

Claim 3 (original): The apparatus of Claim 1 further comprising:
a second shaft within the cylinder.

Claim 4 (original): The apparatus of Claim 1 further comprising:
a fluid within the cylinder.

Claim 5 (original): The apparatus of Claim 1 wherein the sensor is adjacent to the second end of the cylinder.

Claim 6 (currently amended): The apparatus of Claim 1 wherein the aperture is at a center of the first wall.

Claim 7 (original): The apparatus of Claim 1 further comprising:
a light source adjacent to the first end of the wall wherein the light source projects the light through the aperture.

Claim 8 (canceled)

Claim 9 (currently amended): A system for monitoring position, the system comprising:

a cylinder having walls defining an interior wherein the cylinder has a shaft within the interior wherein the shaft extends through a first wall of the cylinder and wherein the shaft is movable transposes through the cylinder and moves from the first wall to a second wall of the cylinder within the interior of the cylinder and further wherein the cylinder has an aperture in the first wall adjacent to the shaft wherein light is continuously projected into the interior of the cylinder via the aperture; and

a sensor on ~~a~~ the second wall of the cylinder wherein the first wall is opposite to the second wall of the cylinder wherein the sensor is located within the interior of the cylinder wherein the sensor extends inward from the second wall to the interior of the cylinder wherein the sensor detects an amount of light within the cylinder at the second wall which is not absorbed by the shaft and further wherein the amount of light detected by the sensor corresponds to a position of the shaft within the interior of the cylinder.

Claim 10 (previously presented): The system of Claim 9 wherein the sensor is located at a center of the second wall.

Claim 11 (original): The system of Claim 9 further comprising:

a fluid within the system.

Claim 12 (previously presented): The system of Claim 9 further comprising:

a head attached to the shaft wherein the head is located between the sensor and the aperture.

Claim 13 (original): The system of Claim 9 further comprising:

a second shaft within the cylinder wherein the second shaft is movable within the cylinder.

Claim 14 (original): The system of Claim 9 further comprising:

a window within the aperture.

Claim 15 (original): The system of Claim 9 further comprising:

a light source adjacent to the aperture wherein the light source projects the light through the aperture.

Claim 16 (original): The system of Claim 9 further comprising:

a processor connected to the sensor.

Claim 17 (original): The system of Claim 9 further comprising:

a coating on the shaft wherein the coating absorbs light.

Claim 18 (currently amended): A method for measuring a position within a cylinder having walls defining an interior wherein the cylinder has an interior surface and an exterior surface wherein the cylinder has a length defined between a first wall and a second wall wherein the cylinder has an aperture formed in the first wall and further wherein the cylinder has a head within the interior wherein the head ~~is movable~~ moves within the interior of the

cylinder ~~from between~~ the first wall to the second wall, the method comprising the steps of:

directing light into the interior of the cylinder through the aperture;

attaching a light sensor to the interior surface of the cylinder at the second wall wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor;

detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall;

moving the head of the cylinder within the interior of the cylinder between the first wall and the second wall of the cylinder wherein the head of the cylinder moves linearly with respect to the second wall of the cylinder; and

determining a first position of the head in the interior of the cylinder with respect to the second wall of the cylinder wherein the first position of the head corresponds to the amount of light detected by the light sensor.

Claim 19 (currently amended): The method of Claim 18 further comprising the step of:

moving the head to a second position within the cylinder
wherein the second position is located between the first position
of the head and the interior surface of the cylinder between the
first end wall and the second end wall.

Claim 20 (original): The method of Claim 18 further comprising the step of:

placing a fluid within the cylinder.

Claim 21 (previously presented): The method of Claim 18 further comprising the step of:

connecting a magnet to the head of the cylinder wherein the magnet is adjacent to the exterior surface of the cylinder.

Claim 22 (previously presented): A method for measuring a position within a cylinder having walls defining an interior wherein the cylinder has an interior surface and an exterior surface wherein the cylinder has an aperture within one of the walls and further wherein the cylinder has a head within the interior wherein the head is movable within the interior of the cylinder, the method comprising the steps of:

directing light into the interior of the cylinder through the aperture;

attaching a light sensor to the interior surface of the cylinder wherein the light sensor extends inward with respect to the interior of the cylinder;

detecting an amount of the light in the interior of the cylinder which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light;

determining a position of the head in the interior of the cylinder wherein the position of the head corresponds to the amount of light detected by the light sensor; and

connecting a magnet to the head of the cylinder wherein the magnet is adjacent to the exterior surface of the cylinder.

Claim 23 (new): A method for measuring a position within a cylinder having walls defining an interior wherein the cylinder has an interior surface and an exterior surface wherein the cylinder has a length defined between a first wall and a second wall wherein the cylinder has an aperture formed in the first wall and further wherein the cylinder has a head within the interior wherein the head is movable within the interior of the cylinder from the first wall to the second wall, the method comprising the steps of:

directing light into the interior of the cylinder through the aperture;

attaching a light sensor to the interior surface of the cylinder wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor;

detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall;

determining a position of the head in the interior of the cylinder wherein the position of the head corresponds to the amount of light detected by the light sensor; and

connecting a magnet to the head of the cylinder wherein the magnet is adjacent to the exterior surface of the cylinder.